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Subject: RE: Institutional cookers and solar thermal technology

Attachment: IMG_0437.JPG [3715 KB]

Pat,

Thank you for the good information.

As you know, we tested three solar cookers (photo attached) – these solar cookers were selected for testing with support from PCIA (now integrated with the Alliance), and the Alliance is supportive of our testing of solar cookers.

At the Forum in Cambodia, I will show the attached photo in my presentation, and I will be discussing our testing of the solar cookers along with testing of cookstoves. We tested the solar cookers before the stoves (to take advantage of best solar conditions). I won't be presenting final results for solar cookers or stoves at the Forum, because data analysis and QA reviews are not completed yet, but I'll discuss results in general terms. I expect that final results for the solar cookers will be published before the results for the stoves. An EPA post-doctoral fellow has been assigned to prepare a journal article with results from the solar cookers.

Results from many studies are showing that more than one cooking device is often needed to meet the needs of users and goals of projects, and I think solar energy has good potential to help meet goals for clean cooking.

Regards,
Jim

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From: Patricia Mcardle [mailto:solarwind1@me.com]
Sent: Thursday, March 07, 2013 1:18 PM
To: Mitchell, John

Cc: Ranyee Chiang; Dar Curtis; louise meyer; Elisa Derby; Jennifer Tweddell; Cora Shaw; Leslie Cordes; Radha Muthiah; Jacob E Moss; Chloe Shields; Katie Gross; Corinne Hart; Sean Bartlett

Subject: Institutional cookers and solar thermal technology

John,

Here is the question I submitted during today's EPA webinar on institutional cooking:

Why do you continue to ignore solar cooking solutions? Scheffler institutional solar cooking systems are used in many countries to cook for hundreds even thousands of people every day. Please see this two minute video on Scheffler community kitchens: http://www.youtube.com/watch?v=3Olq_jRxr-U. Ajay Chandak in India has designed portable parabolic institutional solar cookers that are being used in schools: <http://www.youtube.com/watch?v=guoecdq9ypk>

Wood burning stoves should be used only when there is no free solar energy available.

The solar cooking sector has not had the advantage of the tens of millions of dollars contributed by the Shell Foundation and now by Alliance donors* for R&D, testing, marketing, the development of standards, etc, however even without this assistance there are many solar cooking technologies being used in large numbers around the world.

* Including the Department of Energy (which has done so much research at NREL and Sandia on solar thermal power) but has allocated its entire \$12.5 million contribution to the Alliance for combustion stove research.

---Thousands of people in India are being fed every day with food cooked by [Scheffler solar community cooking systems](#). The [solar cooking system at this temple](#) prepares 100,000 meals per day and saves \$7,000 a month in LPG costs.

----China currently has ten, 10-year CDM certified solar cooking projects, involving 1,223,200 people in 305,800 households, with global warming savings projected at 7,238,625 tons of CO2. The projects are located in cold, arid but sunny parts of Northwestern China. The first of the projects began in 2009. Five similar projects are currently awaiting CDM registration. They are projected to involve a further 243,000 households and 952,800 people with additional savings of 4,566,560 tons of CO2. I have attached a research paper prepared by Solar Household Energy with detailed information on these projects.

---Tens of thousands of refugees in [Chad](#) and in [Sudan](#) are cooking every day using the inexpensive, [locally made CookIt](#)--a family solar cooker that could be made more durable if only there were research funding available.

I have always supported the GACC's mission to "save lives, improve livelihoods, empower women, and protect the environment by creating a thriving global market for clean and efficient household cooking solutions", however I remain puzzled as to why after two and a half years, the Alliance continues to dismiss the potential of solar thermal cooking technology to make significant contributions to this goal.

All the best,
Pat

[Patricia McArdle](#)
Senior Foreign Service Officer, retired

Arlington, Va.

Editor, [The Solar Cooker Review](#)

YouTube Channel [solarwindmama](#)

Read an excerpt from my
novel [Farishta](#), inspired by the
year I spent in Afghanistan.

www.patriciamcardle.com

"Qatra, qatra darya mesha."

Drop by drop it becomes a river.

--Afghan Proverb

On Feb 27, 2013, at 12:21 AM, Patricia Mcardle wrote:

Hi John,

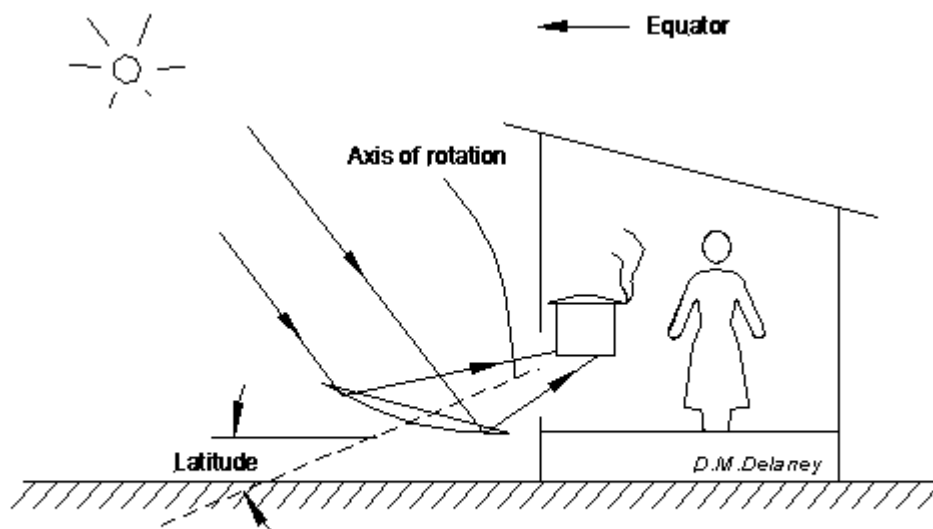
Sorry about that. I embedded the wrong link. Here's the correct link: [Simply Solar Food Processing in Cambodia](#). Simply Solar is a German consulting group founded by Wolfgang Scheffler, the inventor of the Scheffler reflector [solar community kitchen system](#).

Simply Solar has many similar projects including one [in Morocco](#) for the distillation of essential oils from flowers.

A student of Wolfgang's, Gregor Schaeper in [Mexico is constructing Scheffler systems](#) for use as community bakeries.

The website of [Solar Bruecke](#) (the non-profit side of Simply Solar) says that there are about 750 Scheffler reflectors in use worldwide. Some of the larger Scheffler installations in India are providing steam heat to prepare thousands of meals per day at schools, military installations and religious institutions.

In January of last year, I attended a workshop in India to learn how to install and maintain Scheffler reflectors, which are erected and installed on site and have small PV powered tracking systems so they can automatically track the sun all day. The narrow beam of light generated by the mirror is always focused on the same spot, which allows cooking to be done indoors or under a shaded canopy as you can see in this diagram. Here's a [2 minute video I made showing a Scheffler](#) kitchen being used in India.



Reflecting upward along the axis of rotation positions the reflector on the equatorial side of the cooking place, and eliminates the secondary reflector.

Schefflers are installed on site using welded steel tubing and either mirrors or polished aluminum squares that are attached to the reflector with wires. Costs vary depending upon the country and the location in the country. Simply Solar can provide cost estimates for any location. A Scheffler array of 74 mirrors on the roof of Shirdi temple kitchen feeds up to 100,000 pilgrims per day and is reported to save almost \$7,000 per month in fuel.

Because Schefflers require precision installation, they are not portable and thus are not really appropriate for places like refugee camps which will eventually be disbanded. In those cases, portable, institutional solar cookers like [PRINCE 40s \(which can cook five kilos of rice in 55 minutes\)](#) are very cost effective, especially if used in conjunction with retained heat containers that can keep sequentially cooked pots of food hot for serving at the same time. The PRINCE 40, which ships flat, is assembled on site and which has wheels, can hold a 25 liter pressure cooker costs US\$ 750 for charitable and social organisation and US\$ 850 for others. The PRINCE 60 has steps and a sunshade for the cook. It holds a 35 liter pot and can cook 8 kg of rice in one hour.



Both are manufactured in Dhule, India.

It makes neither economic nor environmental sense to burn wood (that must be trucked in from miles away) in an institutional biomass stove during the day when the sun is providing cost free, zero emissions energy that requires no processing and no transportation. Biomass stoves should only be used at night or on cloudy days.

[Here's the report I wrote](#) after attending the Scheffler workshop in 2012.

Please let me know if you have additional questions.

Thanks

Pat

On Feb 26, 2013, at 5:09 PM, Mitchell, John wrote:

Pat,

Thanks for the information on Institutional Solar Cookers.

I went to the first link for the project in Cambodia, but it took me to what looked like a project in India. Could you double check the link for Cambodia? Depending on the location and the size of the project, it could indeed be a nice project to visit.

Do you have a sense of how many of these Scheffler solar reflectors are currently in use, where they are located, how many are sold each year, how much they cost, how much fuel they replace, etc... it would really be great to have a better sense of the totality of this technology.

Thanks,

John

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From: Patricia Mcardle [<mailto:solarwind1@me.com>]
Sent: Tuesday, February 26, 2013 3:49 PM
To: Ranyee Chiang; Mitchell, John
Cc: Dar Curtis; Julie Green; louise meyer; Patricia Mcardle
Subject: Institutional solar cooker in Cambodia

Dear Ranyee and John,

It would be useful for participants in the upcoming webinar on institutional stoves and especially for those attending the March forum in Phnom Penh to be aware of [this commercial solar cooker project in Cambodia](#), which uses two [Scheffler solar reflectors](#) (for indoor solar cooking) to boil palm sap for sugar production. The sap was previously boiled using a wood fire. Now the wood is only used when there's no sun. There are hundreds of [institutional Scheffler reflectors and other institutional solar cooker designs](#) being used in schools and community kitchens--primarily in India. Ajay Chandak's [PRINCE institutional parabolic solar cookers](#) (which ship flat in a box for local assembly) are being used by schools in India's northern provinces where the sun is intense year round, but fuel is scarce. Institutional solar cookers like the PRINCE 40 are a logical complement to institutional wood burning stoves, since they allow wood to be saved for use only at night and on cloudy days. In Mexico, German Gregor Schaper's factory is producing Scheffler reflectors for institutional use [including this solar tortilla factory](#). Each reflector saves the equivalent of 60 liters (16 gallons) of LPG per month.

Pat